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ADVISORY COMMITTEE ON TELECOMMUNICATIONS AND HEALTH CARE

Appointed by the Federal Communications Commission

FINDINGS AND RECOMMENDATIONS

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Dear Commissioners:

The Advisory Committee on Telecommunications and Health Care is pleased to submit its report to the Federal Communications Commission. The report includes the Committee's recommendations on how to implement the provisions of the Telecommunications Act extending telemedicine services to rural areas, as well as findings summarizing the current state of telemedicine. We have also provided general recommendations designed to foster the advancement of telemedicine in the United States and abroad. It is our hope that the report and recommendations will be of value to the FCC and the Joint Board as you implement the universal service provisions of the Telecommunications Act.

The opportunity to serve on the Advisory Committee was a valuable one for the experts who gave their time to participate. The members of the Advisory Committee represent all parts of the health and telecommunications community that are involved in telemedicine. Health professionals, academic experts, telecommunications providers, rural advocates, telemedicine practitioners and many others worked together to provide recommendations to the FCC to encourage the development of telemedicine in ways that would benefit rural residents and their healthcare providers. We have also sought to consider the burden on the telecommunications carriers who will be providing the telecommunications services necessary to bring telemedicine to rural areas.

The Advisory Committee members are united in the belief that telemedicine holds significant promise to improve the availability of needed health services to millions of Americans. In rural areas throughout the U.S., shortages of health professionals, geographic isolation, and the lack of health technology available in more densely populated areas means reduced access to sophisticated healthcare. The telemedicine efforts that are currently underway in many rural areas demonstrate that telemedicine can work to bridge these healthcare gaps and improve the quality of healthcare available to rural residents. In addition to these important gains, the telemedicine specific provisions of the Telecommunications Act benefit rural health providers by reducing the cost of telecommunications services for telemedicine and guaranteeing the availability of an adequate telecommunications infrastructure, which is lacking in many rural areas today.

The sponsors of the telemedicine provisions of the Telecommunications Act have made an important contribution to improve healthcare in rural America. By making telecommunications services affordable, and by making sure that rural areas have sophisticated telecommunications services available to them, the Act begins to give rural healthcare professionals the tools they need to provide the same quality of care as in urban areas.

The continuing development of sophisticated telecommunications technology combined with technological advances in medicine will mean enormous change in the delivery of healthcare in the decade ahead. Long distance consultation with specialists, instantaneous transmission of sophisticated images and data for medical procedures and tests, the electronic availability healthcare information technology, and countless other advances will provide millions of Americans who currently lack adequate healthcare access with the opportunity to enjoy the advances of modern medicine.

We hope the Advisory Committee has made a contribution to the expansion of telemedicine services for rural areas and for all other parts of the country and the world. We have been pleased to serve and are pleased to submit our recommendations for the consideration of the FCC and the Joint Board.

The Advisory Committee would like to thank all those who provided assistance. In particular the Committee is grateful for the assistance of Elliot Maxwell and Lygeia Ricciardi of the FCC Office of Plans and Policy and Thayer Nelson of Managed Care Options.

Sincerely,

Gregory E. Lawler
Chair
Advisory Committee on Telecommunications and Health Care

FCC Telecommunications and Health Care Advisory Committee
Findings and Recommendations

OVERVIEW

The Advisory Committee on Telecommunications and Health Care was established by the Federal Communications Commission to provide advice to the Commission on telemedicine, particularly the rural telemedicine provisions of the Telecommunications Act of 1996. The Advisory Committee is made up of individuals with expertise and experience in healthcare, telecommunications and telemedicine.

The convergence of healthcare technology and telecommunications technology offers an extraordinary opportunity to expand the availability and affordability of modern healthcare. Whether it is long-distance video-conferencing with specialists, the transmission of images or data, the availability of patient information, or medical education materials on the Internet, telemedicine expands access to healthcare. Increased access is of particular importance in rural areas, and the Telecommunications Act recognizes the significant needs of rural areas for a telecommunications infrastructure capable of supporting basic services and the benefits this infrastructure will provide for healthcare.

The Advisory Committee has examined carefully the needs of rural healthcare providers and patients. The services that many take for granted in urban areas are often inaccessible in rural areas. For example, rural residents may have to travel hundreds of miles to reach the nearest hospital; health professionals are often scarce, and in many cases, specialists and modern healthcare technology are completely unavailable.

Rural Americans must also contend with a lack of adequate telecommunications services. In most cases the telecommunications bandwidth available to urban healthcare providers and businesses is not available in rural areas. In several areas of the country, access is extremely limited--a number of rural communities lack rudimentary telecommunications services, relying, for example, on party lines. Where basic telecommunications services for modern healthcare are available, the cost is often four to five times the cost in urban areas, which makes these services unaffordable for rural health providers.

While telemedicine holds much promise to improve the quality of healthcare for rural residents, the Advisory Committee believes that the growth of telemedicine in rural areas will require both an adequate rural infrastructure buildout and a discounted rate.

The Advisory Committee recommends, and believes the Act requires, adequate telecommunications infrastructure to be made available to rural healthcare providers. The telecommunications infrastructure, whether it be wireline or wireless, must be sufficient to allow eligible healthcare practitioners requesting these services to access a basic set of telemedicine applications necessary for healthcare in rural areas. In the opinion of the Advisory Committee, the minimum bandwidth necessary to meet this requirement is 1.544 mbps or the equivalent.

Rural healthcare providers can request telecommunications services up to 1.544 mbps, and the telecommunications carrier is obligated to provide service at the level requested as described in the Recommendations.

The Act specifically mandates that a telecommunications carrier provide telecommunications services to healthcare providers serving those in rural areas at rates comparable to rates in urban areas. The Advisory Committee believes the discounted rate is critical to the success of rural telemedicine, and the comparable urban rate should eliminate differences in urban and rural rates created by distance.

The Committee believes that the Universal Service fund should reimburse the telecommunications carrier for extending the infrastructure to the rural community and for the discounted rate for telecommunications services provided to the rural healthcare professional. To the extent the improved infrastructure can be coordinated with efforts on behalf of schools and libraries, the opportunities will be greater and the costs lower.

The Advisory Committee has made other recommendations which should improve healthcare in rural areas through telemedicine. These recommendations include ensuring access to the Internet for rural health providers at the same cost as access in urban areas, providing bandwidth availability for emergency services, the need for standards to ensure interoperability among networks with differing technologies and telemedicine equipment, and a number of others. The Committee also believes that the rapid changes in technology in both telecommunications and healthcare suggest that a continuing review of the telemedicine package for rural areas is essential.

The telecommunications industry, healthcare providers, health equipment manufacturers, government policymakers and many others are working to expand telemedicine applications, making the advances of modern healthcare available to as many people as possible. As with any emerging technology, there are issues to be resolved, and the Advisory Committee is hopeful that these recommendations to the FCC will assist in the resolution of these issues and the advancement of telemedicine.

TELEMEDICINE

FINDING: Telemedicine has the potential to improve substantially the delivery of healthcare in the United States and the world, improving access to primary care, specialists, technology, education, and research materials. Telemedicine will improve access to and the affordability of healthcare in countless situations. While telemedicine is in the early stages, there are many steps that can be taken to encourage the successful expansion and coordination of telemedicine efforts, and the federal government, along with states and others, should make every effort to assist the growth of telemedicine.

RURAL TELEMEDICINE

FINDING: The telemedicine initiatives underway in many rural areas demonstrate that telemedicine technology does improve the delivery of healthcare, increasing access to healthcare professionals, specialists, and the latest technology.

INFRASTRUCTURE AND COST

FINDING: Rural telemedicine efforts are hindered by a lack of telecommunications infrastructure and the high cost for the use of the existing infrastructure. Upgrading of rural infrastructure is essential if telemedicine is to expand. The cost of telecommunications services must also be affordable.

EFFECT OF COMPETITION ON RURAL AREAS

FINDING: It is generally accepted by the Committee members that competition will be intense as a result of the Act. Investment dollars from new entrants will more likely focus on areas where profit margins are greater than in rural areas and on business customers with higher willingness to pay than nonprofit healthcare providers in rural areas. However, the Universal Service provisions of the Act, and in particular the healthcare provisions, provide mechanisms which help assure that the needs of rural areas will be met.

DEFINITION OF "RURAL"

RECOMMENDATION:

The Telecommunications Act provides that a public or nonprofit healthcare provider serving those in rural areas receives telecommunications services at a rate comparable to the rate for a similar service in an urban area. In determining what constitutes a rural area, the Advisory Committee believes that the FCC should use the Office of Management and Budget's (OMB) designation of metropolitan and non-metropolitan counties, with the "Goldsmith" modification to metropolitan counties.

The Office of Management and Budget uses a designation of metropolitan (metro) and non-metropolitan (non-metro) counties. Lists of urban (metro) and rural (non-metro) counties are readily available.

Because some counties in parts of the country are very large, and contain areas that are clearly rural, the OMB designation should be used with the Goldsmith modification. For example, San Bernardino County in California, which is classified as a metropolitan county, extends from the Nevada border almost to the Pacific. Clearly counties such as these contain areas that are isolated

and lack geographic access to metropolitan areas for health and other services, areas that should be considered rural.

The Goldsmith modification is a method that can be used to identify small towns and rural parts of large metropolitan counties (covering at least 1250 square miles) that do not have easy access to central areas. The Office of Rural Health Policy of the Department of Health and Human Services has used this operational definition of rural areas in large metropolitan counties for more than five years in its Rural Health Outreach Grant Program.

The Office of Rural Health Policy has had considerable experience in dealing with the issue of designating rural areas for healthcare services, using the OMB designation and the Goldsmith variation. The Committee believes the FCC should use the same methodology as the Office of Rural Health Policy in designating eligible rural areas.

MINIMUM PACKAGE OF TELECOMMUNICATIONS SERVICES

RECOMMENDATIONS:

- The telecommunications services that should be available to eligible healthcare providers at rates comparable to those in urban areas are:

    1. Internet access, which provides access to services such as electronic mail, healthcare information, and collaborative applications available on the Internet. (Note that toll-free access to an Internet provider is a pricing or subsidy issue that can be addressed by the Universal Service fund that will be established by the Federal-State Joint Board on Universal Services. See the "Financial Incentives" recommendations). Discounted services for Internet access apply to telecommunications services used to reach an Internet Service Provider (ISP) and not to ISP charges or any additional charges for content, software, etc.; and

    2. Transmission services providing bandwidth of up to 1.544 mbps or equivalent. All dedicated or switched services at or below 1.544 mbps (e.g., 384 kbps) that are part of the carrier's standard offering to business customers in most urban areas in the state must be made available to an eligible healthcare provider upon request (per section 102 of the Act). Under this recommendation, these services, up to 1.544 mbps, would be provided at a discounted rate (e.g., a 384 kbps tariff would be discounted -- see "Financial Incentives" recommendations). If the backbone infrastructure required (see "Backbone Infrastructure" recommendations) to provide these services does not yet serve the community of the requesting healthcare provider, the telecommunications provider will be given a reasonable amount of time to build/upgrade the infrastructure.

        Services such as switched T1 are only available in a very small portion of the country and are not available in many cities. Also, some telecommunications

providers may not have significant deployment of ISDN and/or certain dedicated services below 1.544 mbps, i.e., such services may not be available in the majority of the state. This recommendation is intended to require the designated telecommunications provider to make such telecommunications services available to serve the needs of eligible providers of rural healthcare, if those telecommunications services are part of the carrier's standard offering for the preponderance of the state. As technology improves, costs decline, and the minimum package is revised and updated periodically, new services may become available (see "Advanced Services" recommendations).

3. Based on recent studies of emergency medical care, approximately eighty percent of the casualties in emergency situations are in rural areas, while only twenty percent are in urban areas. This is because of the long distances from rural communities to urban trauma centers and the fact that a majority of trauma expertise resides in urban areas. To help reduce this imbalance between urban and rural areas, a minimum of 4.8 kbps data transmission rate and voice communications should be enabled from ambulances and helicopters in rural communities to emergency departments and urban trauma centers. Since there is a critical need for emergency services in rural areas to transmit much more information than possible with 4.8 kbps, this aspect of the minimum package should be continuously evaluated as new mobile wireless technologies become available and costs decline.

   In the case of cellular technology, analog cellular is currently being deployed widely. Circuit switched data calls can be made using modems on these systems providing up to 4.8 kbps data communications capability. For these calls, data communications are established by connecting the modem in the mobile terminal through the cellular switch and the public switched telephone network to the modem at the terminal in the emergency department of an urban trauma center. There is a variety of potential technological solutions to achieve speeds significantly greater than 4.8 kbps. Data communications speed can be increased to 14.4 kbps by using special cellular modems including a modem pool at the cellular switch (this would be in addition to cellular sites needed to cover rural areas). These modems use enhanced proprietary protocols and technologies such as Enhanced Throughout Cellular from AT&T Paradyne, MNP-10 and MNP-10EC from Microcosm and TX-CEL from Celeritas. Cellular Digital Packet Data is another technology that can provide up to 19.2 kbps. However, this technology is not yet widely available even in urban areas. Digital Personal Communications Services (PCS), a newly authorized mobile service, is expected to provide higher speed data communications capabilities in the future. One-way communications from the mobile units to a fixed terminal in a trauma center can be achieved at high speeds using satellite technology provided that part of the frequency spectrum can be allocated for this application.

For data transmission from airplanes and helicopters, currently there are restrictions from the FAA and FCC regarding use of cellular systems. Though technically it is feasible to transmit data using cellular or satellite systems, the FCC will have to allocate part of the frequency spectrum in conjunction with the International Telecommunications Union (ITU) in order to enable emergency applications.

- The "market basket" (see explanation provided in "Notes on Minimum Package Recommendations") of essential telemedicine applications should be reviewed and updated as necessary but at least every two years. Telemedicine applications and technologies are evolving rapidly and there will be a continuing need to review and update the telecommunications services covered under the Act. The review should include input from a broad range of healthcare providers, telecommunications carriers, and others involved in telemedicine. The objective is to continue moving toward the goal of providing affordable telemedicine services in rural areas comparable to those found in urban areas. We recommend that for these biennial updates, a survey of well-served areas be conducted and used as input to revise the "market basket". Using the revised "market basket" of applications as a guide, the minimum package of telecommunications services should be adjusted to meet those application needs. However, use of the minimal package of telecommunications services should not be restricted only to applications in the "market basket" especially since important applications in rural areas may differ from those in urban areas. Hence, any telemedicine application chosen by eligible healthcare providers can be used on the minimum package of telecommunications services.

NOTES ON MINIMUM PACKAGE RECOMMENDATIONS

In determining what telecommunications services to recommend, the Advisory Committee developed a "market basket" of telemedicine services as a guide to estimate what level of telecommunications services would be necessary to support rural telemedicine efforts. The "market basket" included:

- Healthcare provider to healthcare provider consultation - Physicians and non-physician healthcare providers (nurses, physician assistants, etc.) in rural hospitals and clinics should be able to consult (includes triage) professionals in other locations and should have the capability to transmit data and medical images such as x-rays;

- Healthcare provider to patient consultation - Patients in rural hospitals and clinics should be able to be examined/counseled in a multimedia format depending on need by physicians/specialists and non-physicians (e.g., dietitians, occupational therapists, physical therapists, nurse specialists in clinical areas such as diabetes and mental health, etc.) in urban medical centers for consultation and triage utilizing a variety of examination devices such as electronic stethoscopes, ophthalmoscopes, otoscopes, EKGs, etc.;

- Rural physicians and other healthcare providers should be able to participate in continuing medical education programs;

- Rural healthcare providers should have access to the most current medical information through the Internet;

- Rural emergency departments should be able to get 24 hour a day support (includes triage) from on-call physicians/specialists either at urban centers or at a local physician's office;

- A comprehensive set of specialty services such as radiology, dermatology, selected cardiology, pathology, obstetrics (fetal monitoring), pediatric, mental health/psychiatric should be enabled as a result of the capability to transmit high speed data and high quality images to urban medical centers;

- Emergency departments and trauma centers in urban areas should be able to interact with paramedics directly at the scene in case of emergencies in most rural areas. Helicopters and ambulances in rural areas should be able to transmit real-time information on vital signs such as temperature, blood pressure, EKG, etc. to emergency departments or trauma centers in urban areas.

The "market basket" was only used as a guide to determine the recommended telecommunications services, and the minimum package should not be restricted to only applications in the "market basket." The eligible healthcare provider should be able to use the telecommunications services in the minimum package for any telemedicine applications the healthcare provider determines necessary. This is especially important since needed applications in rural areas may differ from those needed in urban areas.

If an eligible healthcare provider places its standard voice communications or other non-telemedicine communications on this facility, the discount will be adjusted to reflect only the percent of time or percent of bandwidth used for telemedicine applications.

In general, parameters including the size of the healthcare facility and the number of patients served would be input for the bandwidth requirements. For example, a rural hospital may require 1.5 mbps whereas 128 kbps may suffice for a two doctor clinic. However, the Advisory Committee decided not to attempt to specify requirements by size of facility. Rather, we believe prices of services, even at discounted rates, will serve to self-monitor use of discounted services. For example, a two doctor rural clinic will likely not be able to afford excess telecommunications capacity even at discounted rates.

BACKBONE INFRASTRUCTURE DEVELOPMENT

RECOMMENDATIONS:

- The Committee recommends that Universal Service funds be used by an eligible telecommunications provider (per Section 102 of the Act) to build/upgrade the backbone infrastructure required for rural telemedicine. The existing backbone infrastructure of the designated telecommunications providers will likely vary greatly in different parts of the country and perhaps even in neighboring rural areas. Hence, the Universal Service funds should not be allocated evenly across states (or local areas), but rather should be allocated based on the costs of upgrading/extending the designated provider's existing backbone to meet rural telemedicine needs.

- The upgraded telecommunications backbone infrastructure should be shared among schools and libraries as well as healthcare providers.

- To the extent that the eligible telecommunications provider uses a backbone that was built/upgraded with Universal Service funds to enable the provision of profitable services to other businesses in rural areas, a mechanism should be put in place to repay the Universal Service fund from profits derived from such services. Note that the backbone does not provide the services, rather it enables the service to be provided. If, e.g., a business orders a T1 line, the telecommunications carrier needs to invest in facilities to provide that line from the backbone to the business site. However, it should be noted that such profit opportunities may not be very large in rural areas and may only recover a small portion of the total cost of the backbone infrastructure.

ADVANCED SERVICES

RECOMMENDATIONS:

- Advanced telecommunications services should enable high quality audio and video for telemedicine applications such as consultation and healthcare provider/patient interactions and the capability to transmit and receive high quality multimedia diagnostic images with almost no delays. Certain services that would not be feasible with the minimum package should be enabled by advanced services. For example, in the case of emergency services, video transmission from ambulances and helicopters could be enabled by advanced services. By providing competitively neutral rules, the advanced services provisions of the Telecommunications Act would encourage availability of telecommunications services with bandwidth beyond 1.544 mbps to eligible healthcare providers. It is expected that the cost of providing these services will be high under the current state of technology. However, we recommend that during each biennial review of the minimum package, more advanced services be considered for inclusion since today's high cost advanced services may become more affordable as technology improves and costs decline.

- Some states have undertaken construction programs for statewide digital networks using advanced technologies such as Asynchronous Transfer Mode (ATM) to provide digital connectivity. Two approaches have been used by these states. One approach uses a public/private partnership for building the infrastructure where the network is built, owned, and operated by private sector telecommunications firm. A second approach involves building a subsidized network where the state, for the most part, acts as a telecommunications service provider for the backbone infrastructure. Networks such as these provide high bandwidth telecommunications capabilities statewide and these may facilitate the advanced services provisions in the Telecommunications Act. However, the Act's competitively neutral rules for the advanced services should be aimed at encouraging private sector involvement and competition among private sector firms.

  The vision of an advanced National Information Infrastructure (NII) as described, for example, in vision statements by the Clinton/Gore administration, the Council on Competitiveness, and the Computer Systems Policy Project is to enable applications, which can be made available to all Americans, that will improve and promote healthcare, education, libraries, manufacturing productivity, jobs creation, electronic commerce, intelligent transportation systems, entertainment, and other key areas. The NII, as a network of interoperable networks, will likely be the shared platform upon which advanced telemedicine can be affordably provided in the future. To achieve the vision of an advanced NII will require large investments by the private sector, estimated to be in the hundreds of billions of dollars for network facilities alone. Without this investment by the private sector reaching all areas of the country, the NII will not be achieved nor will its potential benefits for healthcare be realized. However, the private sector will likely not make such investments in areas where it would have to compete with government owned or subsidized networks -- for one cannot compete with a free or subsidized good. Hence, in order to encourage, rather than discourage, private sector investments and competition, we recommend that the FCC establish competitively neutral rules which ensure that federal, state, or local government-owned or subsidized communication networks do not unfairly compete by selling network services or excess capacity as commercial services in unfair competition with the private sector.

ALTERNATIVE INFRASTRUCTURE TECHNOLOGIES

RECOMMENDATIONS:

- Several technologies, both wireline and wireless, can be used economically to build upon the embedded infrastructure to support the telecommunications services we recommend. Such technologies include copper, fiber optics, cable TV, microwave, satellite, cellular, and other wireless technologies that may be more or less appropriate for particular areas depending on terrain and the existing infrastructure. Depending on the telemedicine applications used, a combination of these technologies may be appropriate. Since the technologies and the infrastructure used will likely differ even within a particular rural area, we recommend that the FCC establish policies that encourage interconnection standards and interoperability among networks with heterogeneous technologies. The Internet Protocol version 6 (Ipv6) is a strong

candidate for such an interoperability standard. In addition, the use of Internet Protocol (IP) over Asynchronous Transfer Mode (ATM) and over other technologies should also be encouraged.

- We also recommend that the FCC work with the telecommunications and other related industries, and with appropriate government agencies, to form transition plans to develop the infrastructure in rural areas and the recommended telecommunications services the infrastructure enables (e.g., dedicated 1.5 mbps facilities) to an advanced National Information Infrastructure (NII). In such an NII, networks with heterogeneous technologies are interoperable. These transition plans will help assure that the nation evolves towards widely available advanced switched and/or routed services which can benefit healthcare providers, schools, and libraries as well as the private sector. The NII will allow for maximum sharing of facilities, thus reducing costs.

- Section 102 of the Telecommunications Act sets out requirements for the designation of telecommunications providers responsible for Universal Service. In designating such carriers, it may be desirable to select a partnership of firms using a variety of interoperable technologies that can most cost effectively meet the overall needs of a rural area.

ON-PREMISES TELEMEDICINE EQUIPMENT

RECOMMENDATION:

Although the Telecommunications Act focuses on telecommunications services necessary for the provision of telemedicine, other types of "infrastructure" are also needed for telemedicine. This includes telemedicine equipment/peripherals, information technology, (e.g., information systems for medical records including data repositories) and telecommunications systems software and hardware that reside in the healthcare provider's location and is interoperable with medical centers. It also includes multimedia personal computers with coder/decoders (CODECs) for desktop video and room video conferencing equipment. It is important that policies are in place to encourage interoperability among the various equipment providers. For video conferencing equipment, adherence to H.261 standards should be encouraged. Similarly for teleradiology applications, dental imaging, microscopic slide and endoscopy images, the use of DICOM standards should be encouraged for the image acquisition and processing equipment. DICOM is now being applied in multiple medical specialties, and the FCC should encourage continued discussion of DICOM as a basic communications device standard. The FCC should work with other agencies of the federal government and the private sector to ensure interoperability.

TELEMEDICINE EQUIPMENT

FINDING: The Telecommunications Act does not appear to have provisions for infrastructure other than telecommunications networks. This is a major concern to healthcare providers in rural and underserved urban areas, and additional mechanisms should

be considered to ensure that end to end telemedicine applications can actually be implemented. What good is the infrastructure, if telemedicine equipment is not available and affordable? However, it must be noted that the cost of such equipment is likely comparable in rural and urban areas.

TELEMEDICINE INFORMATION

RECOMMENDATION:

Eligible telecommunications carriers and others providing telemedicine services to rural areas under the Act should provide eligible healthcare providers with information on the telecommunications services available for telemedicine applications. The FCC, together with any other relevant federal agencies, should work with the telecommunications carriers to offer healthcare providers in rural areas information on the telecommunications services that are available to support telemedicine. A central clearinghouse on the telemedicine services currently being used, the telecommunications services required, the costs of the telemedicine and telecommunications services, and other information that will assist rural healthcare providers is important to the successful expansion of rural telemedicine efforts.

FINANCIAL INCENTIVES

RECOMMENDATIONS:

- Universal Service funds to support the provision of telecommunications services for telemedicine in rural areas should be provided directly to telecommunications providers. The eligible telecommunications provider(s) should be credited from the Universal Service fund with the difference between urban and rural rates for the use of telecommunications services in the minimum package by eligible healthcare providers. The healthcare provider also receives financial incentives indirectly, since he is billed at discounted rates for the telecommunications services. The discounted rate is the rate comparable to the urban areas.

- Charges for telecommunications services based on the mileage between points of service have been a particular concern to rural healthcare providers. The Advisory Committee strongly believes that the discounted rates should obviate the differences in urban and rural areas created by distance. However, we take no position on how state or federal commissions ought to deal with the general issue of whether or not tariffs should be distance sensitive. Without attempting to dictate the details of how the FCC should apply this recommendation, we will give two examples and potential solutions to illustrate and clarify our objective.

  The first example involves a case where tariffs for a particular service are distance sensitive, but not usage sensitive in both a rural and an urban area. In this example, charges for, say, a 1.5 mbps service in the minimum package between two eligible rural healthcare providers located 100 miles apart should be no higher, in total, than the charges for a similar service

between two urban providers located 10 miles apart (where 10 miles is perhaps the average length of 1.5 mbps facilities in the relevant urban area). In this first example, the Universal Service payment to the telecommunications provider would be the difference between the total distance sensitive charges for the 100 mile rural service and the total distance sensitive charges for the 10 mile urban service. The bill to the rural healthcare provider would be that of the equivalent 10 mile urban service.

The second example involves dial-up Internet access. Suppose in a particular rural area, it is a long distance call to the nearest Internet Service Provider (ISP). If an eligible rural healthcare provider uses the Internet for 15 hours in a given month, the long distance phone charge would be $90 (900 minutes of use at, for example, a 10 cents per minute long distance charge). Suppose in a typical urban area in the same state, Internet access was readily available via a flat rate local call. In this example, the bill to the rural healthcare provider should be zero from the long distance provider. The Universal Service fund payment should be $90 to the telecommunications provider. Also, note that the telecommunications portion of T1 access to the Internet by eligible rural healthcare providers would be handled in a similar way to the first example above.

- The disparity of current use of telemedicine applications from rural area to rural area should not be construed as a reason to favor one area over another, one application over another, or one specialty over another. Thus, the previous recommendations regarding the minimum package, backbone development, and financial incentives should be broadly and equitably applied to all eligible telemedicine activities in rural areas regardless of the applications or specialties.

- The financial incentives should be implemented in such a way that telemedicine is market driven to the maximum extent possible. This will allow each rural area to evolve from its unique state to expanded use, and to new uses, of telemedicine in an optimal manner. Market demand, to the extent possible, should also drive infrastructure development.

RESALE

RECOMMENDATION:

Section 254(h)(3) of the Act prohibits the resale of telecommunications services and network capacity provided to eligible users at discounted rates. This prohibition ensures that the services provided are used by eligible healthcare providers for the purposes intended by the law. For example, if a public or nonprofit institution that is provided subsidized network services resells those services, it is, in effect, unfairly competing with private sector telecommunications providers by reselling network services and network capacity at a price that could be below the telecommunications provider's standard rates yet at or above the rate charged to the eligible healthcare provider. Such actions not only violate the prohibition on resale in the law but provide an economic disincentive for telecommunications providers to build the infrastructure needed by rural areas for healthcare and other needs.

The cost to the eligible healthcare provider for discounted telecommunications services used for telemedicine is clearly a valid cost of providing healthcare. An eligible healthcare provider may charge the recipient of the healthcare service, either directly to the patient or other consumer, or to an insurance company or other payor, for the cost of the telecommunications service and this charge should not be considered a resale under section 254(h)(3).

A consortium of eligible providers is also considered to be an eligible healthcare provider under section 254(h)(5)(B). A consortium of eligible providers may purchase discounted services for a group of eligible providers, and be reimbursed by its constituents for the telecommunications services used for telemedicine without violating the resale prohibition. The use of consortia to provide telemedicine services to eligible providers, through cooperative or other joint venture businesses, should be encouraged. The consortium providing telemedicine services must be nonprofit, and those using the telemedicine services must be eligible under the Act. By combining demand, such users could purchase high capacity telecommunications services, which are often less expensive than multiple lower capacity services, to achieve the same total capacity, reducing the cost of telecommunications services the members of the consortium would have paid individually. To the extent that consortia can include schools and libraries receiving benefits under the Act, the advantage to rural communities would be even greater.

Eligible healthcare providers should not be permitted to resell discounted network services or network capacity to ineligible parties at any price. While the Advisory Committee believes that consideration should be given to expanding eligible parties (see "Additional Opportunities for Telemedicine Services"), this should not be accomplished by allowing eligible providers to resell to ineligible providers.

URBAN/RURAL COST DIFFERENTIALS

RECOMMENDATION:

We recommend that under the auspices of the FCC, studies periodically be performed to compare urban rates versus rural costs-plus-profit for those telecommunications services in the minimal package (keeping in mind the minimal package will be reviewed and updated at least every two years). The resulting differentials will vary over time and from region to region. These results should be used as the basis for reimbursing the designated telecommunications providers in rural areas for discounted services in the minimal package used by eligible healthcare providers.

ADDITIONAL OPPORTUNITIES FOR TELEMEDICINE SERVICES

RECOMMENDATIONS:

- The Telecommunications Act provides a specific list of public and nonprofit healthcare providers who are eligible to receive discounted telecommunications services under the Act,

and obviously the recommendations of the Advisory Committee apply to the eligible healthcare providers under the Act. At the same time, while sympathetic to the concept that a system of incentives or discounts should not be available to for-profit healthcare providers, the Advisory Committee believes that it is important to understand the complex relationships among healthcare providers that exist, whether the providers are rural, urban or suburban. For example, doctors work in independent practices, in clinics, in managed care arrangements of many varieties, in hospitals, and in countless other settings. Nonprofit hospitals employ healthcare professionals of all kinds, run clinics, own other hospitals, and are acquiring physician practices. To remain competitive, many nonprofits are acquiring for-profit healthcare ventures and institutions.

Because these relationships are complex, the distinction between nonprofit and for-profit should not be the defining one in determining who should be eligible for discounted telecommunication services in rural areas. It is important that a system of telemedicine incentives not provide a competitive imbalance in the healthcare delivery system. The importance of telemedicine is the improved delivery of healthcare to the rural resident; discounted telecommunications services used for a telemedicine application that allows a for-profit healthcare professional to consult with a specialist at an academic health center should be viewed as a healthcare benefit to the patient, not an unfair subsidy to the healthcare professional. The Advisory Committee recommends that the FCC and the Congress look carefully at who is eligible to participate under the Act, keeping in mind the complex and competitive arrangements in the current healthcare delivery system and the need to provide the advantages of telemedicine to as many rural residents as possible.

- Most healthcare is provided in rural areas by for-profit healthcare professionals, many of whom are operating in single-office settings often in remote areas. They are dedicated individuals operating with small profit margins at best. If they are not using telemedicine, the rural area is, for the most part, not using telemedicine since the preponderance of healthcare in rural areas is provided by such individuals. The Advisory Committee is concerned that such individual for-profit rural healthcare professionals are ineligible to receive discounted services under the Act and may not be able to afford non-discounted services. If this is the case, then even with the Act, telemedicine will not adequately be used in rural areas. We suggest that the FCC explore mechanisms, including the possibility of new legislation, to address this issue. One solution would be to extend the eligibility criteria to those individual for-profit rural healthcare providers with a set of rules that assures they will not receive subsidized telecommunications service unless they cannot afford to purchase services at non-discounted rates. Of course, extending the eligibility may also require an increase in the amount of Universal Service funds needed to subsidize the discounts.

- Like rural areas, many urban areas do not have adequate access to healthcare services, often lacking access to the latest medical technology and experiencing chronic shortages of healthcare professionals. Telemedicine could increase access to healthcare in these underserved urban areas. The provisions of the Telecommunications Act that provide specific incentives for telemedicine in rural areas do not apply to urban areas. Because telemedicine can help address the healthcare problems of underserved urban areas, the Advisory Committee

believes that it would be beneficial for the FCC and the Congress to investigate whether incentives for the development of telemedicine in underserved urban areas would be appropriate.

- Nursing homes and other long-term care facilities in rural communities often provide valuable healthcare services. The FCC should consider recommending that the Telecommunications Act be amended to include nonprofit nursing homes and other nonprofit long-term care facilities.

- The FCC should consider recommending that the Telecommunications Act be amended to include not-for-profit providers of home healthcare services. Home healthcare is expected to grow rapidly in coming years. This is due to the growth of the elderly population and the availability of cost effective healthcare services in a home environment or in assisted living care facilities. As the rural infrastructure is built up, technology evolves and prices decline, it may be possible for eligible home healthcare providers in rural areas to use telecommunications services for making electronic housecalls to the elderly, chronically ill, and homebound mentally ill. These services may become an integral part of healthcare services in the future. Compressed video with perhaps less than full motion may become available in rural homes for the care of such patients in this time frame. In considering this recommendation, costs for including not-for-profit providers of home healthcare services need to be considered as well as the impact on Universal Service fund requirements. Similarly, the long-term benefits of including not-for-profit providers of home healthcare services need to be quantified, since they may outweigh the costs.

INTERNATIONAL TELEMEDICINE

FINDING: Telemedicine offers promise to enhance the wellbeing of people throughout the world. Special benefits include enhanced ability to track and prevent infectious disease, administer population based public health programs like immunization campaigns, and provide training for health professionals and officials. Promotion of international telemedicine will help contain outbreaks and reduce incidence of diseases globally. International telemedicine also provides opportunities for the U.S. to export expertise to a larger community, and this provides a two-way benefit where the U.S. can educate foreign providers and learn from local medical practices elsewhere. The resultant referrals can create new revenue streams for U.S. medical institutions. In developed countries U.S. telemedicine can assist with Internet delivery, commercial on-line services, electronic publishers, or satellite transmissions.

INTERNATIONAL TELEMEDICINE PARTNERSHIP

FINDING: The goal of international telemedicine providers should never be to foster the dependence of underserved communities, but to form partnerships that improve

global access to quality healthcare. Local empowerment should be emphasized rather than importing of foreign expertise, and U.S. efforts should be tailored to practice patterns in developing countries keeping in mind that epidemiological factors, risk factors, populations at risk, preventive strategies, treatment protocols, and patterns of communication are not identical to those in the U.S.

INTERNATIONAL EXPERIENCE

FINDING: Systems like the U.S. military's Worldwide International Maritime Satellite System INMARSAT (used in Somalia) show the promise of sophisticated global telemedicine, but for many international telemedicine applications, print, videotape, audio teleconferencing, and store and forward technology with fax machines and existing telecommunications are sufficient. Two-way audiovisual communication is rarely necessary, and when it is, (emergency and medical treatments) the cost of technology should be compared to cost of transportation of patients to referral centers for consultation.

INTERNATIONAL BARRIERS

FINDING: Many of the barriers to international telemedicine implementation are similar to those found in the U.S.; for example, access to telecommunications infrastructure at reasonable and affordable rates; availability of capital; competing priorities for public resources; varying medical licensure requirements; incompatibility of existing telecommunications systems; liability issues; and technology access and Internet access. There are also additional barriers to telemedicine in an international setting, including the availability of local personnel (medical and technical) in the foreign locations; existence of appropriate payment mechanisms (insurance or otherwise) in various foreign locations; the effect of multiple time zones; the lack of internationally accepted standards and protocols for all medical and telecommunications equipment and services; the existence of foreign government restrictions, licenses, permits, etc., for the construction of telemedicine facilities; the existence of import duties on medical and telecommunications equipment in the various foreign locations; concern about relinquishing control over local health and medical systems; and political and language barriers between countries/regions. There may be additional difficulties where U.S. treatment patterns are not appropriate for cultural and technological reasons. Additionally, many foreign countries have public health systems, so market forces to promote development of applications may be lacking.

PROMOTION OF INTERNATIONAL TELEMEDICINE

RECOMMENDATION:

The FCC should work to ensure that foreign and domestic healthcare providers can access domestic and international telecommunications facilities at fair and affordable rates, and the U.S. government should promote implementation of international telemedicine by U.S. providers. Efforts should include funding assistance for initial support of private sector telemedicine providers when no other funds are available; encouraging international organizations (World Healthcare Organization, International Telecommunications Union, UNESCO) to address issues of standardization and protocols; supporting organizations already committed to global healthcare like Pan American Health Organization and NASA; developing trade policies that address tariff barriers to the transport and implementation of medical equipment and foreign assistance policies that reward the implementation of telemedicine; lowering of economic barriers to the free flow of healthcare services and information. The U.S. should provide developing countries with assistance in educational areas by providing networking expertise needed in partially developed programs of telemedicine. Also, the U.S. and other government entities should fund telemedicine pilot programs and initiatives in underdeveloped countries and regions.

WORKING GROUP FOR INTERNATIONAL TELEMEDICINE

RECOMMENDATION:

A working group should be established to support the promotion of international telemedicine. The group should be composed of representatives from various federal agencies (FCC, HHS, USTR, DOC, DOD) as well as private sector enterprises involved in telemedicine and members of the medical and academic/research community. The working group should have adequate resources so it can effectively serve as an advocate for and facilitator of international telemedicine exchanges and act as a clearinghouse for international telemedicine information.